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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to an ink cartridge exchange style and the ink cartridge exchange style especially included in an ink jet recording apparatus.

[0002]

[Description of the Prior Art] It is in the inclination for many ink jet-type recording devices to be used recently at printers, such as a personal computer, and the printing mechanism of facsimile apparatus. A such ink jet-type recording apparatus makes the ink stored in the ink cartridge blow off at a jet ceremony, makes printing and a print image form in the record paper, has neither the image quality of definition, nor noise generating, and is equipped with the advantage of a low running cost.

[0003]

[Problem(s) to be Solved by the Invention] In the above ink jet-type recording apparatus, it usually has the composition of making an ink cartridge carrying in movable carriage. However, with such a conventional configuration, in case all ink was consumed and exchange of an ink cartridge was needed, ink cartridges were exchanged by manual operation. For this reason, printing was performed at the time of an absence, since it could not succeed in the suitable correspondence by equipment itself when it became an ink piece, printing was uncontinuable, therefore, for example at the time of facsimile reception, a communication link was not continued but there was a problem of carrying out error termination. Furthermore, generally it mistook in the specific location of the carriage of a complicated configuration also about loading of an ink cartridge not only in the time of ink piece generating under printing, had to load with the ink cartridge that there is nothing, and was very inconvenient to the general user.

[0004] It was made in order that this invention might solve such a technical problem and a fault that the conventional technique has, and the purpose is in offering the ink cartridge exchange style in which self-chambering of an ink cartridge is possible.

[0005]

[Means for Solving the Problem] The ink cartridge exchange style which starts this invention in order to realize said technical problem The carriage of a configuration of repeating wearing and release of an ink cartridge, whenever it builds in the cartridge frame which can equip with an ink cartridge and the external force of the predetermined direction acts on this cartridge frame, Have at least one holder section which has the holder slot which stops an ink cartridge, and it has a rotatable cartridge holder. Said holder section is characterized by considering as the configuration which gives the external force of said predetermined direction to said cartridge frame in said carriage directly or indirectly by rotation of said cartridge holder.

[0006]

[Function] At ink cartridge exchange guard concerning this invention, the ink cartridge was stopped, or it considers as the wearing condition or release condition of an ink cartridge, and, therefore, exchange or wearing of an ink cartridge is automatically made because the holder section which can stop an ink

cartridge gives the external force of the predetermined direction to the cartridge frame in carriage directly or indirectly by rotation of a cartridge holder.

[0007]

[Example] Hereafter, the example of this invention is explained based on an accompanying drawing. First, the configuration of this invention is explained. The configuration of the ink jet recording device which included the ink cartridge exchange style concerning this invention in drawing 1 is shown. In this drawing, the ink jet recording apparatus P is equipped with the belt 13 which moves by the ink cartridge exchange style 1 concerning this invention, the controller 8 which has memory 8A, the carriage motor 12, and the carriage motor 12, and changes.

[0008] The ink cartridge exchange style 1 concerning this invention The carriage 10 which is equipped with the ink piece detector 11, builds in the cartridge frame 15 which can equip with an ink cartridge 20, and attaches and moves to a belt 13, The 1st holder section 4 which has holder slot 4A which stops an ink cartridge 20 (refer to drawing 6), It has the 2nd holder section 5 which has holder slot 5A which stops the supplement ink cartridge 25 (refer to drawing 6) to both ends, respectively, and the core is supported to revolve free [rotation] by the holder motor 3, and consists of a cartridge holder 2 of a rotatable abbreviation rectangle by the holder motor 3.

[0009] Carriage 10 has wearing of an ink cartridge 20, and composition which repeats release, whenever above external force acts on the cartridge frame 15 all over drawing so that it may explain in full detail behind. The 1st and 2nd holder sections 4 and 5 give above external force indirectly to the cartridge frame 15 in carriage 10 through direct or an ink cartridge by rotation of the cartridge holder 2. Holder slot 4A of the 1st holder section 4 has stop projection 4B, incorporates the ink cartridge 20 which became empty from carriage 10, and stops the projection (not shown) of an ink cartridge 20 by stop projection 4B. Holder slot 5A of the 2nd holder section 5 has stop projection 5B, and stops the projection (not shown) of the supplement ink cartridge 25.

[0010] Drawing 2 is the explanatory view of the configuration of the carriage 10 shown in drawing 1 . Furthermore, drawing 3 thru/or drawing 5 are the explanatory views of carriage 10 of operation. By drawing 2 , carriage 10 is a KO typeface-like and is equipped with the lock device 16 in which it has an abbreviation heart-like slot in the surface inside in drawing. Inside carriage 10, it is always caudad energized all over drawing with the spring 17 with which the cartridge frame 15 prepared free [migration in the vertical direction in drawing] was further attached in carriage 10 by the shape of a KO typeface. From the cartridge frame 15 surface, up, the tip of a projection and guide 16A has cylindrical guide 16A, and it is fitted in the slot of the shape of the abbreviation heart of said lock device 16. Inside the cartridge frame 15, it can equip with an ink cartridge 20 through downward opening, the hold pawls 15A and 15A of a pair are supported to revolve by the both-sides lower limit of the cartridge frame 15 rotatable, and the hold pawls 15A and 15A of a pair are energized in the direction always opened with Springs 15B and 15B.

[0011] Moreover, the projections 10A and 10A of a pair are formed in a carriage 10 both-sides lower limit, and if said hold pawls 15A and 15A contact these projections 10A and 10A and are pressed, the hold pawls 15A and 15A have composition which resists the energization force of Springs 15B and 15B, and is closed.

[0012] Based on drawing 2 - drawing 5 , actuation is explained below. Like drawing 2 , there is a cartridge frame 15 caudad all over drawing, and after the hold pawls 15A and 15A of a pair have opened, guide 16A is located in the drawing Nakashita edge of the slot of the shape of the heart of the lock device 16 in contact with wall 18A. The location where the lower right as moved to the upper right along with wall 18C if guide 16A will move to the upper left along with wall 18B if an ink cartridge 20 is inserted in the cartridge frame 15 from downward opening here and an ink cartridge 20 makes the cartridge frame 15 the method of drawing Nakagami, and pushed up further, and shown in drawing 3 contacts wall 18F of ** and wall 18C is reached.

[0013] At this time, the cartridge frame 15 is in the method of drawing Nakagami within carriage 10, and will be in the condition that the hold pawls 15A and 15A of a pair were pushed on the projections 10A and 10A of a pair, and closed, therefore it is equipped with the ink cartridge 20 in the cartridge

frame 15. It is stabilized very much in the location which contacts wall 18H and wall 18K upward slanting to the right as the lower right contacts [guide 16A] wall 18H of ** although the cartridge frame 15 will fall caudad by energization of a spring 17 if push raising to the upper part of an ink cartridge 20 stops here, and it moves to lower right direction along with wall 18H and it is shown in drawing 4.

[0014] That is, stability is equipped with an ink cartridge 20 in the cartridge frame 15 in this condition. In addition, in migration of the aforementioned guide 16A, since the location of wall 18C and arris part 18E of wall 18F is on the right of the location of arris part 18D of the upper left edge of wall 18H, also in case the cartridge frame 15 falls caudad by energization of a spring 17, guide 16A does not return in the direction of the lower left.

[0015] Next, if external force is applied to an ink cartridge 20 or the cartridge frame 15 upward from this stable state, from a stable state, an ink cartridge 20 and the cartridge frame 15 will get used, and will move up. Consequently, as shown in drawing 5, guide 16A contacts wall 18L upward slanting to the right, and advances to an upward slant to the right along with wall 18L, and soon, the lower right contacts 18 Ns of walls of **, and stops it in arris part 18M. If external force is lost here and push raising to the upper part of an ink cartridge 20 stops, although the cartridge frame 15 falls caudad by energization of a spring 17, the lower left will contact wall 18Q of **, and will move to lower left direction along with wall 18Q, and guide 16A will be soon stabilized very much by it in arris part 18R.

[0016] Namely, the cartridge frame 15 moves the inside of the lock device 16 to the method of drawing Nakashita in this condition, and the hold pawls 15A and 15A of a pair are released from press of the projections 10A and 10A of a pair, open, and will be in the condition of drawing 2. Consequently, an ink cartridge 20 can be taken out and exchanged. In addition, in migration of the aforementioned guide 16A, since the location of arris part 18M of wall 18L and 18 Ns of walls is on the right of the location of arris part 18P of the top right corner of wall 18K, also in case the cartridge frame 15 falls caudad by energization of a spring 17, guide 16A does not return in the direction of the lower left.

[0017] As mentioned above, if the lock device 16 of carriage 10 will be in the stable state which equipped with the ink cartridge 20 when external force was applied to the method of drawing Nakagami and external force is applied to the method of drawing Nakagami further once again, it will be in the stable state which released the ink cartridge 20. If external force is furthermore repeated, it has composition which repeats an aforementioned ink cartridge wearing condition and an aforementioned release condition by turns.

[0018] Drawing 6 - drawing 8 are the explanatory views of the ink cartridge exchange style concerning this invention of operation. Moreover, drawing 9 is the operation flow chart of the ink cartridge exchange style concerning this invention. Based on each [these] drawing and drawing 1, actuation of the ink cartridge exchange style concerning this invention is explained below. The controller 8 of the ink jet recording apparatus P sets to the location of the recording paper 23 the carriage 10 with which it is equipped with the ink cartridge 20 by the carriage motor 12 (step S1), and starts printing (step S2). If the ink piece detector 11 detects ink piece generating (step S3), a controller 8 will interrupt printing actuation (step S4), and as shown in drawing 6, it will move carriage 10 to a cartridge holder 2-way.

[0019] If carriage 10 stops in a predetermined location, the holder motor 3 will rotate the cartridge holder 2 counterclockwise, and will set to a predetermined location (step S5). While holder slot 4A catches the projection (not shown) of the base of an ink cartridge 20 which became empty, passes stop projection 4B and stops to the bottom of holder slot 4A in this set process, above external force is made to act on the empty ink cartridge 20 by the counterclockwise rotation of the cartridge holder 2 further. Consequently, although the cartridge frame 15 in carriage 10 will be in the condition which shows in drawing 5, if the holder motor 3 rotates the cartridge holder 2 clockwise here, as mentioned above, the cartridge frame 15 in carriage 10 will open a pawl, and will release the empty ink cartridge 20. If the cartridge holder 2 is further rotated clockwise with this condition, the empty ink cartridge 20 will be incorporated by the 1st holder section 4 of the cartridge holder 2 (step S6).

[0020] Subsequently, the 2nd holder section 5 which has stopped the supplement ink cartridge 25 is moved to a carriage 10 side, and, subsequently carriage 10 is returned to a predetermined location at the

same time it moves carriage 10 in the detail-paper 23 direction, and abbreviation-half-rotates the cartridge holder 2 counterclockwise and moves the 1st holder section 4, as shown in drawing 7. The holder motor 3 rotates the cartridge holder 2 counterclockwise, and sets to a predetermined location here (step S7). The supplement ink cartridge 25 enters in the cartridge frame 15, and makes above external force act on the cartridge frame 15 by the counterclockwise rotation of the cartridge holder 2 in this set process. Consequently, the cartridge frame 15 moves upward, as said drawing 3 explained, it closes hold pawl 15A, and it will be in the condition of having incorporated the supplement ink cartridge 25 as shown in drawing 8.

[0021] If the cartridge holder 2 is rotated clockwise here, the projection (not shown) of the base of the supplement ink cartridge 25 will escape from holder slot 5A, and the supplement ink cartridge 25 will be set to the cartridge frame 15 in carriage 10 (step S8). And a controller 8 moves carriage 10 in the recording paper 23 direction, and resumes printing actuation (step S9). When printing is continued, it returns to step S3 and actuation is repeated.

[0022]

[Effect of the Invention] It is effective in the ability also of the ink piece at the time of facsimile reception to carry out [when printing is performed, for example at the time of an absence since it considered as the configuration which the ink cartridge / which was explained above / exchange style which starts this invention like is consistent in loading of removal of an empty ink cartridge, and a new ink cartridge, and is performed automatically, and it becomes an ink piece, are automatically exchanged by equipment itself in an ink cartridge, and] communication link continuation therefore, for example. Since not only the time of ink piece generating under printing but self-chambering is generally possible for the ink cartridge exchange style which furthermore starts this invention about loading of an ink cartridge, it is mistaken in the specific location of the carriage of a complicated configuration, is released from complicated difficult actuation of loading with an ink cartridge manually there being nothing, and is especially very convenient for a general user.

[Translation done.]